

A NEW SPECIES OF XYRIS (SECT. XYRIS) FROM THE
GULF COASTAL PLAIN

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In the process of an intensive field survey on the distribution and ecology of *Xyris* species in the West Gulf Coastal Plain, we discovered a puzzling entity which did not seem to fit any known species. After making detailed field observations at numerous sites, and searching for additional material at LL, LSU, NLU, SMU, and TEX, we were convinced that it represented a distinct, previously undescribed species.

Xyris louisianica Bridges & Orzell, sp. nov. (Figure 1)

Xyris strictae Chapman simile, sed habitu solitario subcespitoso, basibus plantarum pallidioribus, apice scapi spica angustior, spicis anguste ovatis acutis, seminibus anguste ellipticis 0.5-0.7 mm longis, non fuscatis differt.

Perennial herb, solitary or in small clumps, the plant base equitant, with persistent fibrous remains of old leaves. Leaves narrowly linear, 15-30 (-45) cm long, 2-5 (-7) mm broad, gradually tapering to a slender, incurved tip, dull green above (rarely maroon-brown), and reddish-maroon to reddish-brown toward the base; margins tuberculate or papillate, surfaces smooth. Sheaths of the scape shorter than the leaves, 10-13 cm long, with a short cusp-like blade. Scapes linear, 30-70 (-90) cm long, roundish with several ridges towards the base, somewhat flattened above, with the two marginal ridges papillate or tuberculate, scape apex 1-3 mm wide, definitely narrower than the spike. Spikes narrowly ovoid to narrowly ellipsoid, 1.0-2.0 (-2.5) cm long, 6-8 mm wide, slightly acute, of many tightly imbricate scales. Fertile bracts suborbicular, ca. 5 mm long, the outer surface dark brown with a dark green rectangular dorsal patch, the margins entire, becoming erose at the apex with age. Lateral sepals slightly curvate, 5-6 mm long, reddish brown, the keel ciliate, narrower than the wings. Blades of petals triangular-cuneate, 3.0-3.5 mm long, yellow, opening in the late morning, and closing in the late afternoon or evening. Seeds narrowly ellipsoid, 0.5-0.7 mm long, one end caudate, both ends with darkened tips, opaque, longitudinally striate, slightly farinose, not darkened at maturity.

TYPE: UNITED STATES. LOUISIANA. CALCASIEU PARISH:
SH, NEQ, SEQ, Sect. 30, T9S, R11W; Vinton 7.5' Quad; Swales and
depressions of cutover wetland longleaf pine savannah on N side

of paved road, ca. 1.3 mi NW of Edgerly; Elev. 23', 24 Sep 1987, *Orzell & Bridges 5800* (HOLOTYPE: TEX; ISOTYPES: FSU, GH, LSU, MISSA, MO, NCU, NLU, NY, SMU, TEX, TAMU, VDB).

Additional specimens examined (with abbreviated locality information; full label data is available from the authors;):

LOUISIANA. ALLEN PAR.: Sec. 22, T3S, R5W, 9 Jun 1972, *Thomas 29985* (NLU); Sec. 21, T6S, R6W, 9 Jun 1972, *Thomas 30092* (NLU), 15 Aug 1987, *Orzell & Bridges 5753* (NLU, SMU, TEX); Sec. 26, T6S, R6W, 24 Oct 1981, *Thomas & Allen 79560* (NLU); Sec. 22, T6S, R6W, 15 Aug 1987, *Orzell & Bridges 5756* (MO, NLU, SMU, TEX); Sec. 14, T6S, R6W, 22 Sep 1987, *Orzell & Bridges 5788* (SMU, TEX). BEAUREGARD PAR.: 14 mi W of DeRidder, 17 Jul 1964, *Kral 20736* (SMU); Along RR & LA 27 between Juanita & Singer, 22 Aug 1971, *Thomas 24648* (NLU); Sec. 22, T5S, R10W, 5 Jun 1986, *Thomas et al. 96670* (NLU); Sec. 12, T4S, R9W, 15 Aug 1987, *Orzell & Bridges 5749* (MO, NCU, NLU, SMU, TEX); Sec. 12, T5S, R9W, 15 Aug 1987, *Orzell & Bridges 5752* (LSU, SMU, TEX). CALCASIEU PAR.: Off Westwood Rd, 2.5 mi NW of West Lake, 29 Jun 1969, *Mistretta s.n.* (NLU, 2 sheets); Sec. 31, T8S, R8W, 17 Aug 1987, *Orzell & Bridges 5761* (FSU, LAF, SMU, TEX); Sec. 26, T8S, R9W, 17 Aug 1987, *Orzell & Bridges 5763* (NLU, NY, SMU, TEX); Sec. 24, T9S, R13W, 17 Aug 1987, *Orzell & Bridges 5765* (F, GH, NY, SMU, TEX); Sec. 15, T11S, R9W, 24 Sep 1987, *Orzell & Bridges 5799* (LAF, NLU, GA, SMU, TEX, US). RAPIDES PAR.: Sec. 22 & 27, T5N, R5W, 8 Jun 1978, *Schutz & Schutz 1466* (NLU). ST. TAMMANY PAR.: Sec. 30, T6S, R10E, 11 Jun 1972, *Thomas 30277* (NLU); Sec. 33, T7S, R13E, 20 Jun 1976, *Thomas et al. 49544* (NLU); Sec. 5, T7S, R14E, 27 Sep 1975, *Thomas & Allen 47265* (NLU); Along Hwy 36, 2.2 mi W of Hwy 41, 13 Jul 1983, *Kessler 7335* (NLU); 10 Oct 1970, *Allen 52* (LSU); 7 Sep 1985, *Lievens 1014* (LSU); 8 Aug 1948, *Bougere 23* (LSU); Primate Research Center, Covington, 17 Jul 1964, *Rylander 566* (SMU). TANGIPAHOA PAR.: 14 Jun 1968, *Brown 20985* (LSU); 15 Oct 1919, *Arsene 11140* (LSU); 1921, *Arsene 12548* (LSU). VERNON PAR.: 11 Sep 1981, *Givens 2226* (LSU); Sec. 14, T1S, R8W, 14 Aug 1987, *Orzell & Bridges 5725* (SMU, TEX); Sec. 12, T1S, R8W, 14 Aug 1987, *Orzell & Bridges 5737* (NLU, NCU, SMU, TEX). WASHINGTON PAR.: 5.5 mi SW of Bogalusa, 12 Jun 1966, *Thieret s.n.* (SMU); Sec. 4, T1S, R14E, 25 Jun 1971, *Thomas et al. 23753* (NLU); Sec. 4, T1S, R11E, 17 Aug 1983, *Thomas 85388 & Taylor 4889* (NLU). WINN PAR.: Sec. 2, T11N, R3W, 19 Sep 1972, *Thomas & Cicala 31933* (NLU). MISSISSIPPI. JACKSON CO.: Pascagoula, 14 Oct 1975, *Montz 3554* (LSU); *Demaree 32296* (SMU). PEARL RIVER CO.: *Sargent & Jones 13695* (SMU). STONE CO.: *Kral 17401* (SMU). TEXAS. HARDIN CO.: Near Sour Lake, 19 Jul 1945, *Lundell & Lundell 14126* (LL); 7.4 mi NW of Silsbee, then 2/3 mi S, 9 Jul 1949, *Cory 56639* (SMU); 2 mi S of Kountze, 21 Jul 1964, *Kral 20902* (LL, SMU, TEX); 8 mi S of Kountze, 21 Jul 1964, *Kral 20916* (SMU); 5 mi N of Silsbee, 22 Aug 1972, *Amerson 1275* (SMU); 10 mi W of Kountze, 18 Sep 1959, *Turner 4614* (TEX); 1.8 mi W of Honey Island, 25 Sep 1987, *Orzell & Bridges 5807* (APCR, NLU, SMU,

TAMU, TEX); 4.9 mi W of Honey Island, 25 Sep 1987, Orzell & Bridges 5808 (SMU, TEX). JASPER CO.: Along FS Rd 343, 1 mi S of FS Rd 306, 12 Aug 1987, Orzell & Bridges 5676 (SMU, TEX); N side FS Rd 314, 1 mi W of FS Rd 303, 12 Aug 1987, Orzell & Bridges 5685 (APCR, NLU, NCU, SMU, TEX). LIBERTY CO.: 21 mi SE of Cleveland, 3 Jul 1950, Webster & Wilbur 3185 (SMU). NEWTON CO.: 2.5 mi E of Bleakwood, 15 Oct 1987, Orzell & Bridges 5921 (SMU, TEX). TYLER CO.: Hickory Creek Savanna, Big Thicket National Preserve, 25 Sep 1987, Orzell & Bridges 5802 (ASTC, FSU, LSU, MO, NCU, NLU, TAES, TAMU, SMU, TEX).

Almost all of the additional material cited for *Xyris louisianica* had previously been identified as *Xyris ambigua* Beyr. ex Kunth, which is common throughout much of the South Atlantic and Gulf Coastal Plains. *X. louisianica* superficially resembles *X. ambigua* in its equitant base, relatively long leaves, and ciliate lateral sepals, a combination of characters shared by only *X. ambigua* and *X. stricta* Chapm. among the *Xyris* species of the Southeastern United States. The recognition of these taxa and their limits has been relatively slow. Chapman (1860), in describing *X. stricta*, clearly contrasted it with *X. ambigua*, yet this name was placed in synonymy under the latter by Mohr (1901), Malme (1937), and with some doubt by Kral (1960). Afterward, Kral (1966) recognized the distinctiveness of *X. stricta*, and provided an analysis of its differences from *X. ambigua* and *X. uridifolia*. In the same treatment, Kral noted that two forms of *Xyris ambigua* occur in Mississippi, Louisiana, and eastern Texas. One form has a larger stature and appears the same as eastern *X. ambigua*, while the other is of smaller stature, has more maroon pigmentation of leaf bases and has smaller flowers. He further noted that both forms may cohabit a single site with differences between them quite striking. Some of the distinctive characters of the latter entity, the species here described, were included within Kral's (1966) description of *X. ambigua*. In the field where we have observed *X. ambigua* and *X. louisianica* at the same site they are quite distinct, with no intermediate forms present in hundreds of plants examined at over fifteen sites, particularly regarding the characters of the plant base, leaf shape, petal size and shape, and seed size, shape, and surface. At first, we attempted to fit *X. louisianica* within the range of variation of *X. stricta*, since it resembles this species more than it does *X. ambigua*. However, we were convinced by the habitat and geographical separation and several consistently different characters that these plants were best considered as a new species. Since it had previously been thought of as a form of *X. ambigua*, its differences from this species should be summarized. The plant bases of *X. louisianica* are darker, more reddish-maroon or brown, than the bases of *X. ambigua*, and lack the pronounced dark longitudinal striations of the latter species. The leaves are narrow and ascending, in contrast to the broader, more flabellately spreading leaves of *X. ambigua*. Spike shape is very variable in

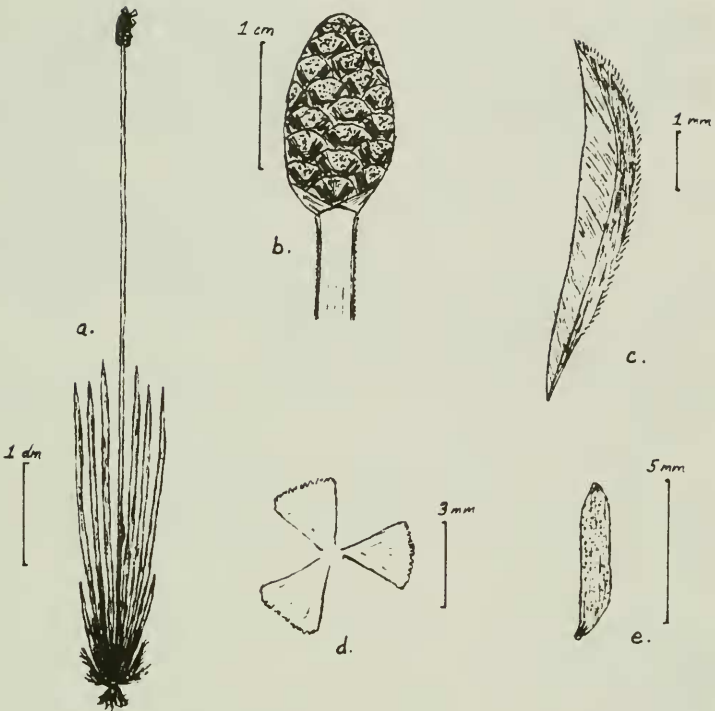


Figure 1. *Xyris louisianica* Bridges & Orzell. a. Habit sketch. b. Spike. c. Lateral sepal. d. Petal blades. e. Seed.

both species, mostly as a function of age of the individual spike and its growing conditions, however, the largest, best developed spikes of *X. louisianica* are not as broad or as sharply acute as those of *X. ambigua*. The scales of the spike also tend to be much darker than those of *X. ambigua*. Several crucial field characters are provided by the fresh flowers, and are not easily observed on dried specimens. The petal blade size and shape and time of day of flowering are clearly different between the two species. The petal blades of *X. louisianica* are very much like those of *X. stricta*, and both have a similar midday to afternoon flowering time, in contrast to the larger, obovate petal blades and early morning flowering time of *X. ambigua*. The seeds of *X. louisianica* resemble those of *X. stricta*, both being narrowly ellipsoid, opaque, and farinose, with those of *X. stricta* slightly longer and distinctly darker in color at maturity. This is in contrast to the more broadly ovoid, translucent, lustrous, smaller seeds of *X. ambigua*. Apparently, Kral had little field experience with this entity, and had not seen its mature seeds, which are not usually well-formed before September. Seed morphology has

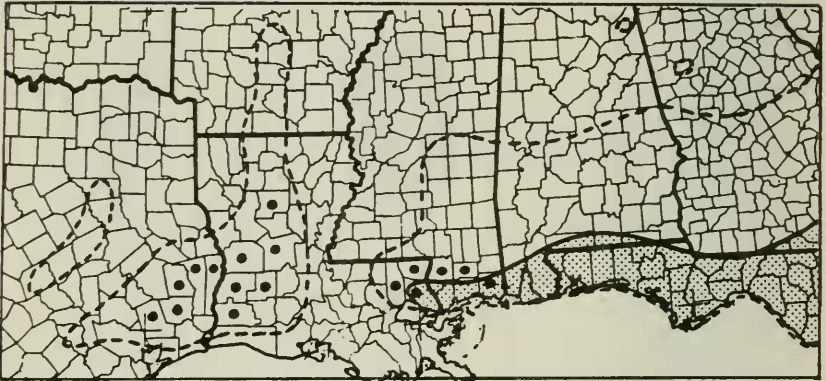


Figure 2. County distribution of *Xyris louisianica* (dots), and western portion of general range of *X. ambigua* (dashed lines) and *X. stricta* (shaded area).

been considered very important in the delimitation of *Xyris* species. Many of the herbarium specimens cited here lack seeds due to their early season collection dates, perhaps contributing to the slow recognition of the distinctiveness of *X. louisianica*.

Xyris louisianica appears to be most frequent in the West Gulf Coastal Plain of southwestern Louisiana and adjacent southeastern Texas (Figure 2). It is most abundant in acid, clay-based wetland longleaf pine (*Pinus palustris* Mill.) savannas on Quaternary terrace surfaces, primarily the Montgomery Formation. The microhabitats for *X. louisianica* include naturally seasonally wet depressions, shallow swales, ditches, and roadsides adjacent to these savannas. It is much less frequent on Miocene age surfaces to the north, and is absent from the coastal prairies to the south. *Xyris louisianica* is also found on the lower terraces of the East Gulf Coastal Plain of extreme southern Mississippi and the adjacent "Florida Parishes" of southeastern Louisiana. *Xyris louisianica* is geographically isolated from *X. stricta* except at the eastern periphery of its range in southern Mississippi and St. Tammany Parish, Louisiana. However, even in this area it appears that the two are not found in the same habitats.

Xyris louisianica occupies drier sites than reported for *X. stricta*, and overlaps the wide moisture-tolerance range of *X. ambigua*. Where *X. louisianica* and *X. ambigua* are sympatric, *X. louisianica* tends to be found in lower, seasonally inundated, depressions or swales, in association with such species as *Cacalia lanceolata* Nutt., *Eupatorium leucolepis* (DC.) T. & G., *Rhynchospora elliottii* A. Dietr., *Pluchea rosea* Godfrey, and *Scleria reticularis* Michx., whereas *X. ambigua* is more commonly on slightly better drained microsites. At some sites, *X. louisianica* can be found with *X. laxifolia* Mart. var. *iridifolia* (Chapm.) Kral,

but is usually slightly higher than this species. Other species of *Xyris* which have been observed by the authors at *X. louisianica* sites include *X. baldwiniana* Schultes, *X. caroliniana* Walt., *X. drummondii* Malme, *X. difformis* Chapm. var. *curtissii* (Malme) Kral, *X. jupicai* L. C. Rich., *X. platylepis* Chapm., and *X. scabrifolia* Harper (Orzell & Bridges, in prep.), although in most cases these are not found mixed within the *X. louisianica* populations.

The following key [modeled after the key between *X. ambigua* and *X. stricta* in Kral (1966)] will serve to distinguish *X. louisianica* from these two species:

1. Seed farinose, narrowly elliptical or narrowly ovoid; spike dark brown, the scales tightly imbricate; plant bases maroon, purplish, dark-brown, or reddish-brown; leaves narrowly linear, gradually tapering from the equitant base to tip; petal blades triangular-cuneate, 0.3-0.5 cm long, open at midday 2
 2. Seed dark when mature, 0.7-0.8 mm long, plant bases dark maroon to dark brown, densely cespitose on wet, mucky substrata; apex of scape conspicuously flattened, almost as broad as the spike; spike oblong-cylindrical, obtuse *Xyris stricta* Chapman
 2. Seed light-colored, 0.5-0.7 mm long, plant bases maroon to maroon-brown, solitary or in small clumps on drier, clayey substrata; apex of scape somewhat flattened, but not nearly as broad as spike; spike narrowly ovoid to ellipsoid, slightly pointed *Xyris louisianica* Bridges & Orzell
1. Seed lustrous, translucent, broadly ovoid; spike pale brown or tan, the scales loosely imbricate; plant bases pinkish, purplish, or stramineous, with dark longitudinal striations on inner leaf bases; leaves shorter, broader, more flabellately spreading, abruptly tapered to tip; petal blades obovate, 0.6-0.7 mm long or more, opening in early morning, usually closed by midday *Xyris ambigua* Beyr.

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